

ECOSYSTEM ALTERATIONS (EA) WORKING GROUP
Manomet Center for Conservation Sciences

Manomet, MA
8:00am to 6:00pm
24 May 2004

MEETING SUMMARY

ACTION: Summary of 2 April, 2004 Meeting Accepted

The Working Group (WG) accepted the summary of the meeting held on April 2, 2004.

ACTION: Summary of 27 April, 2004 Meeting Accepted

The Working Group (WG) accepted the summary of the meeting held on February 26, 2004 with the following revisions.

- Page 2, ***AGREEMENT: Coastal Activities Removed*** wording was added to read: “However, Coastal Activities is an important issue and the WG agreed that the Sanctuary Advisory Council (SAC) should be informed about its importance.”
- Page 20, Appendix C: “...fishing industry, and conservation organizations.” was changed to “...fishing industry, recreational fishing, and conservation organizations.”

ACTION: Study Fleet Information

Perot Systems Government Services, Inc. (PSGS) staff will provide background information concerning the National Oceanic and Atmospheric Administration (NOAA) Cooperative Research Partners Initiative (CRPI) Study Fleet project.

ACTION: VMS Data on Herring

Dave Wiley, Stellwagen Bank National Marine Sanctuary (SBNMS), will request VMS data from the herring fleet to determine the distribution of boats fishing for herring.

ACTION: Data Sources for Recreational Fishing Catch Data

Richard Taylor, Sea Scallop Working Group, and Richard Ruais, Commercial Fishing Industry representative, will provide other sources of data on catch information for recreational fishing. These data sources will be included in Action 4A in the Biomass Removal of Commercial Species Action Plan (Appendix C).

ACTION: Fill In Prey Species Action Plan

Dave Wiley and Mary Beth Tooley, commercial fishing representative, will fill in the Prey Species Action Plan Straw-Man (Appendix B).

ACTION: Rationale for the Removal of Species Removal Action Plan: Action 3

Bruce Munson, recreational fishing representative, to digitize the reason for removing Action 3 from the Biomass Removal of Commercial Species Action Plan (Appendix C).

ACTION: Re-Write of Commercial Species Removal Action Plan: Action 5

Dave Wiley will re-write Action 5 for the Biomass Removal of Commercial Species Action Plan (Appendix C).

ACTION: Pollution Issues Panel Selection

The following individuals have been identified as candidates to serve on a Pollution Panel for the next meeting of the EA WG:

- Bill Robinson
- Allen Michaels
- Judy Pederson
- James Stewart
- Sal Testaverde

ACTION: Next Meeting

The next meeting of the EA WG is scheduled for July.

AGREEMENT: Biomass Removal Resulting from Bycatch and Discard Action Plan, Strategy 1

The WG agreed to the Biomass Removal Resulting from Bycatch and Discard Action Plan, Strategy 1, as written in Appendix A of this document.

AGREEMENT: Biomass Removal Resulting from Bycatch and Discard Action Plan, Strategy 2

The WG agreed to the Biomass Removal Resulting from Bycatch and Discard Action Plan, Strategy 2, as written in Appendix A of this document.

AGREEMENT: Biomass Removal Resulting from Bycatch and Discard Action Plan, Strategy 3

The WG agreed to the Biomass Removal Resulting from Bycatch and Discard Action Plan, Strategy 3, as written in Appendix A of this document.

AGREEMENT: Prey Species Straw-Man Action Plan

The WG agreed to the strategies presented in the Prey Species Straw-Man Action Plan as written in Appendix B of this document.

AGREEMENT: Biomass Removal of Commercial Species Action Plan, Strategy 1

The WG agreed to the Biomass Removal of Commercial Species Action Plan, Strategy 1, as written in Appendix C of this document.

AGREEMENT: Biomass Removal of Commercial Species Action Plan, Strategy 2

The WG agreed to the Biomass Removal of Commercial Species Action Plan, Strategy 2, as written in Appendix C of this document.

AGREEMENT: Biomass Removal of Commercial Species Action Plan, Strategy 3

The WG agreed to the remove Biomass Removal of Commercial Species Action Plan, Strategy 3, as written in Appendix C of this document. The reason for removing this strategy will be included in place of Strategy 3

AGREEMENT: Biomass Removal of Commercial Species Action Plan, Strategy 4 Struck
The WG agreed to strike Strategy 4 of the Biomass Removal of Commercial Species Action Plan.

AGREEMENT: Biomass Removal of Commercial Species Action Plan, Strategy 5 Struck
The WG agreed to strike Strategy 5 of the Biomass Removal of Commercial Species Action Plan.

AGREEMENT: Biomass Removal of Commercial Species Action Plan, Strategy 6 Struck
The WG agreed to strike Strategy 6 of the Biomass Removal of Commercial Species Action Plan.

AGREEMENT: Biomass Removal of Commercial Species Action Plan, Strategy 7 Struck
The WG agreed to strike Strategy 7 of the Biomass Removal of Commercial Species Action Plan.

AGREEMENT: Biomass Removal of Commercial Species Action Plan, Strategy 8
The WG agreed to re-number Biomass Removal of Commercial Species Action Plan, Strategy 8, to Strategy 4 and accepted Strategy 4 as written in Appendix C of this document.

AGREEMENT: Biomass Removal of Commercial Species Action Plan, Strategy 9
The WG agreed to re-number Biomass Removal of Commercial Species Action Plan, Strategy 9, to Strategy 5 and accepted Strategy 5 as written in Appendix C of this document.

AGREEMENT: Biomass Removal of Commercial Species Action Plan, Strategy 10
The WG agreed to re-number Biomass Removal of Commercial Species Action Plan, Strategy 10, to Strategy 6 and accepted Strategy 6 as written in Appendix C of this document.

Working Group Attendees (May 24, 2004):

Name	WG Seat / Affiliation	Attendance
Porter Hoagland	WG Chair	Present
David Wiley	Team Lead (SBNMS)	Present
Ben Cowie-Haskell	Co-Lead (SBNMS)	Not-Present
Michel J. Kaiser	Woods Hole Oceanographic Institution	Not-Present
Robert Steneck	University of Maine	Not-Present
Les Watling	University of Maine	Not-Present
Bob Kenney	University of Rhode Island	Present
Chris Glass	Manomet Center for Conservation Sciences	Present
Frank Mirarchi	Commercial Fishing Industry	Present
Russell Sherman	Commercial Fishing Industry	Present
Phillip Michaud	Commercial Fishing Industry	Not-Present
Mary Beth Tooley	Commercial Fishing Industry	Present
Richard Ruais	Commercial Fishing Industry	Present
Bruce Munson	Recreational Fishing	Present
Jud Crawford	Conservation Law Foundation	Present
Geoffrey Smith	Environmental Defense	Present
Robert Buchsbaum	MA Audubon Society	Present
Rachael Taylor	The Nature Conservancy	Present
Stormy Mayo	Center for Coastal Studies	Present
Susan Murphy	NMFS	Not-Present
Leslie Ann McGee	NEFMC	Not-Present
Susan Snow-Cotter	MACZM	Not-Present
Allison Ferreira	NMFS Alternate for Susan Murphy	Present
<i>Technical Advisors</i>		
Richard Taylor	SSWG	Present
<i>Others Present</i>		
Timothy Feehan	PSGS	Present
Jennifer Ghiloni	PSGS	Present
William Overholtz	NMFS	Present

WELCOME, INTRODUCTIONS AND ADOPTION OF AGENDA

Porter Hoagland, WG Chair, opened the meeting and welcomed all members of the EA WG. After opening comments, the meeting agenda was presented and set for the day. The Chair also asked for corrections to the summaries for both the April 2, 2004 and April 27, 2004 meetings of the EA WG. The WG accepted both summaries, pending the corrections offered by WG members.

OLD BUSINESS AND ACTION ITEMS

Dave Wiley reviewed the action items identified during the last meeting. WG members were asked to provide input as necessary.

References for Seafloor Habitat Recovery Monitoring Program (SHRMP)

James Lindholm, Pflieger Institute, has not yet been contacted regarding the SHRMP references.

Pollution Presentations

Due to time constraints, presentations on pollution issues have been postponed until the next EA WG meeting.

Straw-man Biomass Removal Recommendation

Chris Glass, Manomet Center for Conservation Science (Manomet), and Dave Wiley drafted a straw-man recommendation for biomass removal. The straw-man recommendation is presented in the Action Plan Development section of this document.

Bycatch Reduction Presentation

The presentation on bycatch reduction techniques by Chris Glass was scheduled for this meeting. This presentation is summarized in the Presentations section of this document.

Remaining Action Plan Schedule

Due to time constraints, the topics of pollution, ocean dumping/marine debris and dredge disposal recommendations will be considered at the next EA WG meeting.

PRESENTATIONS

Biomass Removal: Implications of Bycatch

Chris Glass, Manomet Center for Conservation Sciences, presented the WG with information concerning bycatch and discard in the commercial fishing industry in waters of the Northwest Atlantic. Although the information presented concentrated on bycatch in the commercial fishing industry, it can also be applied to recreational fishing.

The Bycatch Issue

Currently, the Magnuson-Stevens Fishery Conservation and Management Act defines bycatch as "fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards...[but not] fish released alive under a recreational catch and release fishery management program." In New England, trawl discard constitutes 47.8 percent of the total catch. Globally, the combined discard mortality rate has been estimated at 35 percent of the total catch.

Bycatch Reduction Techniques

There are many devices or fishing gear modifications that are currently available world-wide to reduce bycatch, including:

- Turtle Excluder Device (TED)
- Size Sorting Devices
- Icelandic Ex-It Grate
- Norwegian SORT-X Grid
- Nordmore Grate
- Raised Footrope Trawl

- “Sweepless” Raised Footrope Trawl
- Separator Trawls
- Square Mesh Escape Windows
- “Topless Trawl”
- Inclined Separator Panel
- Rigid Mesh Extension
- Composite Mesh Codend

Strategies, or tools, currently in use to address the bycatch issue include:

- Nordmore Grate
- Raised Footrope Trawl
- Gillnet Pingers
- Trawl Escape Windows
- Lobster Trap Escape Vents
- Composite Mesh Codends
- Time/Area Closures
- Scallop Dredge Ring Size
- Scallop Dredge Large Mesh Twine Tops
- Mesh Size Increases
- Days At Sea Reduction
- Behavior and Attitude Changes of Fishermen (including stewardship principles and the targeting of quality product)

Taking into consideration all the different strategies and gear modifications used to reduce bycatch, the cumulative impact is being reduced, and fish spawning stock biomass is rebounding in the Gulf of Maine. Using such bycatch reduction techniques, and allowing unintended species to escape, fishermen are better able to target a quality product, enabling them to maximize the per pound profit for their catch.

Composite Mesh Case Study

An example of how gear modifications can be used to reduce bycatch is the composite mesh codend, which is a standard length codend using square mesh on the top half and diamond mesh on the bottom half. The idea behind the composite design is that round fish, such as cod, fit through square mesh while flat fish, such as flounder, fit more easily through diamond mesh. Such a configuration has the added benefit of holding the shape of the diamond mesh open. Diamond mesh has the tendency to tighten under the strain of the catch while square mesh holds its shape regardless of strain. Use of the square mesh holds the diamond mesh open, improving the selective efficiency of the gear.

The selectivity of the following mesh configurations was tested:

- 6.5 in. Square Mesh Codend
- 6 in. Diamond Mesh Codend
- 6.5 in. Square Mesh Over 6.5 in. Diamond Mesh Composite Codend
- 6.5 in. Square Mesh Over 6 in. Diamond Mesh Composite Codend

Selective efficiency was tested using a covered codend technique. A small (3 in.) mesh cover around the entire codend was used to catch fish that escaped through the codend mesh. Each codend could then be compared using the calculated selectivity curve for each species and mesh configuration. The L50, or point at which 50 percent of the catch is retained by the codend, is used for these comparisons. For cod, winter flounder, and yellowtail flounder, the L50 increased for both composite mesh configurations, indicating increased selectivity for size of fish. Alternatively, the data can be compared based on the percentage of catch for each species above and below the minimum landing size (MLS) for each codend configuration (see table below).

Species	Codend Type	Proportion	
		Below MLS	Above MLS
Cod (56 cm MLS)	6.5" Square	16%	84%
	6" Diamond	27%	73%
	6.5" Square/6.5" Diamond	3%	97%
	6.5" Square/6" Diamond	6%	94%
Winter Flounder (30.5 cm MLS)	6.5" Square	23%	77%
	6" Diamond	20%	80%
	6.5" Square/6.5" Diamond	4%	96%
	6.5" Square/6" Diamond	7%	93%
Yellowtail Flounder (33 cm MLS)	6.5" Square	25%	75%
	6" Diamond	15%	85%
	6.5" Square/6.5" Diamond	5%	95%
	6.5" Square/6" Diamond	6%	94%

For each species, using the composite codend configurations increases the percentage of fish above MLS and decreases the percentage of catch below MLS. Further studies have since been conducted using larger mesh sizes as currently required by NOAA/NMFS and the New England Fisheries Management Council.

Questions & Answers

Question 1: It seems that with something like the composite codend, one would be catching the largest fish. In the literature, there is a suggestion that very large fish need to be avoided. Do we need to have a mix of sizes?

Answer: We are currently catching more fish with less effort, which is decreasing towing time and time on the bottom. We are also taking a smaller percentage of fish on average. Fish are living longer before being harvested. These fish are multiple spawners by time they are harvested.

Question 2: How would you see the issue of gear changes and management go for bycatch reduction?

Answer: There is an argument saying that this work has been done on a small number of vessels in small sector of the industry and in a small area, making the results not applicable to multi-species stocks. However, these gear modifications do work. The SBNMS should help to develop the next generation gear.

Comment: WG members stated that the region has seen mesh size increases from 3 in. to 6.5 in., which is the largest mesh size being used in the world. When using small mesh in the past, fishermen cut out meshes to be used as escape windows. Now the mesh sizes used are as large as the windows they once made. Towing was once done night and day. Now the nets spend less time on the bottom, reducing impact as well.

Question 3: Would it be more helpful to have gear modifications or bycatch reduction techniques written into management?

Answer: That could go either way. If modifications work, fishermen will start using them voluntarily. Fishermen have had to put up with constant changes concerning their gear. If regulation for bycatch reduction is written well, fishermen could be very supportive. They should be given some credit for the measures they have been taking.

Comment: Some WG members were concerned with the consistency of management as it has changed. There is frustration with the current management system, in terms of mesh size regulations. In order for codend mesh size and MLS to be effective, the 2 have to work together. There is currently 1 mesh size when fishing for groundfish. The problem is, that there are 3 different MLS for 3 different flounder species and different minimum landing sizes for different round fish species as well. Regulators have to effectively put mesh size and MLS together. If this was done properly, it would be very effective.

Comment: Though present improvements are impressive, WG members stated that we must acknowledge improvements, but recognize that we are a long way from where we could be for the ecosystem.

Comment: WG members stated that an impediment to gear modification is the rate of regulatory change in the past decade. Further regulation would be difficult since everyone is scrambling to meet the needs of new regulations. If SBNMS was to lead the way in terms of gear modifications, it could have a very positive effect on regional management. Everyone is spread thin, including researchers on this topic. However, interest is growing and work on bycatch reduction should be encouraged. The data from this research needs to be integrated at the management level.

Question 4: How much does a composite codend cost?

Answer: The average cost for this type of codend is minimal, only around \$300.

Comment: It was recommended by some WG members that, since it seems like this is pointing towards fishing regulations, the WG should recommend to the Sanctuary Advisory Council (SAC) that the designation document be changed to allow for fishing regulation. Although research can be done with no change in designation, it looks like fishing regulations are becoming a recommendation.

Comment: Other WG members stated that if using the composite codend was made mandatory in the Sanctuary, and it was done in a way that was proactive and showed acknowledgement for what the fishing industry has accomplished, there would be a very positive response from the commercial fishing industry. Current management seems to have missed an opportunity.

Regulations state that either square or diamond mesh can be used, but there is no statement of using the 2 together in a composite codend.

Biomass Removal: Implications of Prey Species

William Overholtz, National Marine Fisheries Service (NMFS), provided the WG with information concerning the importance of prey species for the ecosystem. To understand predator and prey interactions within the ecosystem it is important to know the fisheries that exist, predator abundance, and prey abundance. Fishing pressure can have an effect on both predators and prey. Predators eat a variety of prey species, the consumption of which can change over time. Prey abundance can fluctuate and populations can be resilient; however, this can differ based on species.

System Type Comparison

Understanding the type of system one is studying is important when describing predator and prey interactions. A boreal system is one that has few species with high connectivity, which can have a direct impact on growth, reproduction, and abundance for the species in the system. Interactions between species in a boreal system are low in number and not complex. A temperate system is one with large numbers of species with low connectivity, where impacts between species are indirect. Prey shortages in a temperate system are unlikely due to the large number of species available as prey, and a large number of complex interactions between species.

In the Northeast, the system is temperate. The connectivity between species is low, given that there are many top predators creating many interactions between species. The trophic complexity is high, with 80 species or species groups and 2,500 interactions between those species.

Herring and Sand Lance

For pelagic species in the Northeast, 18 are resident species and 16 are seasonal species that occur in the more southern regions. Many of these species do not grow out of a body size that is larger than that for being prey. Two prey species were identified in this presentation:

- Gulf of Maine (GOM) Atlantic Herring: The population for this species in the GOM became very low in the 1960s and 1970s, to a point where herring was extirpated from Georges Bank. Herring aggregate, and do so regardless of population size. Data from trawl and acoustic surveys shows that Atlantic herring have recovered. Herring are now more abundant than historic levels.
- Sand Lance: Data for sand lance is not good, since their small body size makes surveys considerably difficult. However, sand lance abundance was high in the late 1970s and early 1980s. Sand lance abundance receded to low levels during the 1990s but is now higher (50,000 to 100,000 mt. biomass). No fishery currently exists for this species, although some have been attempted in the past.

Predator Prey Consumption

Atlantic herring is a prey item for a variety of predator groups in the GOM. These include:

- Medium pelagics and bottom fish (cod, bluefish, monkfish, pollock)
- Marine mammals
- Sea birds
- Large pelagics (tuna, mako shark, blue shark, swordfish)

Herring are not the only prey items available. Other prey items include mackerel, butterfish, sand lance, illex and loligo. Data from the consumption of these items by spiny dogfish show increasing and decreasing patterns over the years. Over time, the abundance for each species fluctuates, and all species are eaten.

Conclusions

In terms of prey abundances, it is concluded that a closed area for prey fish such as herring would not be effective because they do not demonstrate prolonged residency in the area. A closure for sand lance might be more beneficial because, when abundant, they show occupancy for multiple months. For non-resident prey species there would be no measurable effects from a closure. Closed areas would be more useful based on the preservation of biodiversity or for habitat. It is important to maintain the biomass of all resident species for a system. Fisheries should be managed based on the available surplus of prey and predator species.

Questions & Answers

Question 1: When looking at biomass targets, as other species increase in abundance, will they need more herring?

Answer: Predators will probably switch from one prey species to another. The system is not balanced on herring alone. If current biomass estimates accounted for predation, it would probably show that there is a much larger increase in herring biomass.

Question 2: What about river herring?

Answer: There are 4 herring species identified as river herring. They have been observed but are probably not as big an impact as Atlantic herring, although we could be underestimating their abundance. The data presented is only on Atlantic herring.

Question 3: Herring and sand lance seem to have a reciprocal relationship. Do you come to the same conclusion?

Answer: Both mackerel and herring seem to prey on sand lance. Other things are being consumed, but sand lance do make up a large part of the herring diet. Sand lance and herring also compete for food. There is probably a reciprocal relationship on a local level. It is possible for a large school of herring to move to a location and have effects on local sand lance abundance.

Question 4: Some changes over the past 30 years seem to show that the system is becoming more boreal. Shouldn't we be concerned that changes we make are actually making the system more boreal?

Answer: The system has a large capacity for recovery. The key is maintaining a high biomass for all species in the system. There are still many interactions that have not been shown.

Question 5: It is apparent that predatory fish are opportunistic. Are whales able to switch prey species quickly and be as opportunistic?

Answer: Whales such as humpback and fin whales that eat fish can be very opportunistic. They have the ability to move great distances in a short period of time to find other food sources. They can switch between prey species as well. Whales that eat fish are very flexible.

Question 6: What are the migration patterns for Atlantic herring?

Answer: Herring undergo a spring and fall migration. They move from offshore areas in the GOM and Georges Bank and migrate to onshore areas south of Cape Cod and New Jersey in the

fall, and then return off shore in the spring. The Georges Bank stock ranges from the Great South Channel to the northern portion of Georges Bank. Herring in the GOM migrate to spawning areas. Herring in the sanctuary would be moving through the area during these migrations, but GOM stock assessment is not great.

Question 7: Why is the stock assessment in the GOM for herring not great?

Answer: Basically it is because no program for a herring stock assessment exists.

Question 8: Why would closures for prey species not be effective?

Answer: There would not be anything, ecologically, to measure. It would be better to have closures based on biodiversity or habitat concerns.

Comment: WG members stated that since herring are so mobile, having a protective area in the ocean would not be an effective means for their protection.

Question 9: How has stomach content for predators changed over time?

Answer: It is variable. Predator and prey abundance has changed, and so has fishing. All these changes have effects on predator diet.

Question 10: Do predators have a search image for prey?

Answer: The factors that affect which prey is eaten by predators are swimming speed, size, and availability. There could be a search image, but predators are very flexible in what they consume.

Question 11: Is there really a difference between extinction and extirpated?

Answer: Extirpation is a localized extinction. Historically, herring were very high in abundance. During the 1970's there were no adults and no larvae. Herring was basically driven to extinction on Georges Bank. The recovery was very slow. There was no herring on Georges Bank for a very long time. Herring slowly worked back into coastal areas and into the GOM. Then the stock came back on Georges Bank.

Comment: Some WG members agreed that no herring could be found out on Georges Bank in the 1970s, but information on sand lance is a different question. They are locally very abundant and live in very "fluid" sand environments. SBNMS and Great South Channel may be important areas for sand lance. Each species is different.

Comment: WG members stated that this is a good example of how resilient the system is in the Northeast. In Canada, very high abundance of capelin is needed for large stocks of cod. Here, fishing for herring, taking only some of the prey, does not have as much an impact given the abundance of other prey species.

ACTION PLAN DEVELOPMENT

ACTION PLAN: Biomass Removal Resulting from Bycatch and Discard

The Chair opened discussion on the Straw-man Action Plan concerning biomass removal resulting from bycatch and discard. The proposed Action Plan can be found in Appendix A at the end of this document.

All additions suggested by the WG are marked in **BLUE** and deletions are marked in **RED** font. Issues raised during this discussion are noted below.

Issue 1: Strategy 1: Maximize information concerning bycatch and discard occurring within the SBNMS.

To deal with the problem of unintended bycatch while fishing, the WG determined that more information would be needed concerning all aspects of bycatch and discard occurring within the SBNMS. To gain further knowledge about bycatch and discard, it was decided that the Sanctuary should work in coordination with other agencies, fishing groups and NGO's to develop a study fleet of all vessels fishing in the Sanctuary. This was included as Action 1 for this strategy.

The WG also felt that the Sanctuary should improve information pertaining to the spatial and temporal distribution of commercial and recreational fishing efforts within the Sanctuary. This was included as Action 2.

As surveys provide key information on species within the Sanctuary, the WG stated that the Sanctuary should conduct and facilitate directed surveys to determine the spatial and temporal distribution of species within the sanctuary in Action 3.

To account for the knowledge of local fishermen, the Sanctuary should work with fishermen to use local knowledge to identify the spatial and temporal distribution of species and size classes of key species within the sanctuary. This was included as Action 4 for this strategy.

After amendments were made, the WG accepted Strategy 1 as written in Appendix A of this document.

Discussion: The WG was in agreement that data on bycatch and discard should be collected by commercial fishing vessels participating in a study fleet. Currently, there is a study fleet in existence in the Northeast. It is important for the SBNMS to be clear that it will work with programs currently in use, to provide greater detail that is specific to the Sanctuary — wording to this effect was added to Action 1. WG members were also concerned that any program of this type should be collected tow-by-tow and that some mechanism for checking data accuracy and timely reporting should be established. This was also added to Action 1. In addition, data would be needed on the temporal and spatial distribution of commercial and recreational fishing effort within the Sanctuary. Action 2 was developed to account for this. It was determined that there was detailed data on habitat and bathymetry within the Sanctuary, but little was known on fine-scale temporal and spatial data on Sanctuary species. Multiple projects would need to be established that could build on what is already known and integrate with research projects already in existence. This data would also help understand bycatch, fishing effort, and the distribution of species. The WG decided that surveys should be conducted to collect this information and that working knowledge of local fishermen should be used when collecting data and conducting surveys. Fishermen's knowledge could help identify trends and would provide direction for research.

Comment: Some members expressed that there is a progressive group of fishermen that want to get involved and help maintain a sustainable fishery. These fishermen have involved themselves in the study fleet project voluntarily because they want the job done right and want to do the best job possible. It is necessary to have committed individuals involved in projects.

Comment: Other WG members stated that the right tone must be struck in order to make industry want to work with those who are collecting data. Projects within the Sanctuary could be used to improve these issues and to guide everyone towards working together better.

Comment: WG members cautioned that a great deal of effort is needed to do survey programs. There is currently an effort under way to gather new survey data and integrate it with what we already know. There is a great deal that we currently understand, but the gaps in that knowledge are large and need to be filled in.

Issue 2: Strategy 2: Reduction of unintended bycatch and discard from within the SBNMS.

Fishing gear modifications and tools currently exist to help reduce bycatch and discard in the fishing industry. Using such methods or developing new ones, should be used to reduce unintended bycatch and discard within the SBNMS. As Action 1 of this strategy, it was stated that methods should be found to avoid the capture of non-target species and size-classes. However, the use of time and area closures as a method of bycatch reduction was a source of debate for the WG. To address this issue, the WG determined that 2 options should be drafted:

1. time and area closures.
2. time and area closures should not be used unless they are voluntary.

The WG agreed that research must continue to develop new methods of reducing bycatch and discard. As such, the WG agreed that the Sanctuary should promote cooperative research into methods to eliminate all types of unintended bycatch through gear modification. This idea was included as Action 2 of this strategy. After amendments were made, the WG accepted Strategy 2 as written in Appendix A of this document.

Discussion: The WG discussed how the Sanctuary could promote, conduct, and coordinate research on improvements to gear that could be implemented in the fishery. The Sanctuary is currently unable to do this as a regulation. Using existing gear modifications and tools to reduce bycatch would be the priority. The WG was in disagreement on the use of time and area closures as a tool to reduce bycatch. Such areas could be created in spots of high abundance in bycatch that could be avoided by the industry. However, area closures can be seen as fishing regulation, which the Sanctuary is currently unable to do. Such area closures could be supported if they were made voluntary. As a compromise, Options were added to Action 1.

There was also some concern as to the survivability of fish that escaped through bycatch reduction devices. Studies have been conducted in Europe and here in the Northeast. It was determined that the survivability of species is variable, but it is better to sort fish at the time they encounter the gear rather than on deck. However, research into the effectiveness of gear modifications to reduce bycatch should include mortality studies.

Comment: Although innovations such as the composite codend are a great idea and work well, some WG members cautioned that one type of bycatch reduction gear would not work for all issues. A “one size fits all” solution will not work with the day-to-day operations of a commercial fishing boat. Methods need to be developed that reduce bycatch and impact, but keep revenue high for the boat. The value of fish is very important. Gear that has been developed is a great start and there is much to work with.

Comment: Some WG members expressed that habitat should be focused on when discussing reductions for bycatch. Measures taken should include the entire ecosystem and the SAC needs to know that the SBNMS is an important area, and why. Closed areas could be used for comparison studies for bycatch and for benthic impacts. The information could be exportable outside the Sanctuary.

Comment: Other WG members expressed that closed areas would not accomplish much of anything in terms of bycatch reduction. Without gear modifications, bad gear would still be bad gear. Any closure would just force effort to go somewhere else.

Comment: It was the opinion of some WG members that any discussion of area closures should be carried out by the NEFMC, and not the WG.

Issue 3: Strategy 3: Increase awareness of low bycatch gear options and provide incentives for their use.

With research continuing on bycatch reduction methods, the WG agreed that it was important to increase awareness of bycatch reduction gear options and encourage their use. While discussing this issue, it was agreed that the Sanctuary should convene periodic workshops to gather, assess, and disseminate information concerning the state of reduced bycatch and discard gears to fishermen. This was added as Action 1. To encourage the use of new gear modifications, Action 2 was included stating that the Sanctuary should establish a working group to identify appropriate fishing gear and explore Sanctuary endorsement for such gear types that can be used in conjunction with “green marketing”. After amendments were made, the WG accepted Strategy 3 as written in Appendix A of this document.

Discussion: The WG determined that awareness of bycatch reduction devices should be increased throughout the industry. There would also be a need for promoting the use of bycatch reduction devices and encouraging their use. One incentive could be the use of “green marketing”. Such a marketing campaign should not be used to promote a particular gear type over another, but should focus on improving how the gear works. Workshops to gather and distribute information on bycatch reduction techniques should be assembled. This was included in Action 1 for this strategy. Action 2 was developed to incorporate the use of “green marketing”.

Comment: With the idea of “green marketing”, fishermen want to be recognized for the positive work they have done to reduce bycatch. WG members expressed that recognition should be given and that there should be a distinction between fish caught in bycatch “friendly” ways and fish caught by other means.

Comment: Some WG members stated that “green marketing” could be use in conjunction with time and area closures. Those fishermen that avoided areas of high bycatch could be seen as bycatch “friendly”.

ACTION PLAN: Prey Species

The Chair opened discussion on the straw-man action plan concerning prey species. The proposed straw-man action plan can be found in Appendix B at the end of this document. All additions suggested by the WG are marked in **BLUE** and deletions are marked in **RED** font. Issues raised during this discussion are noted below.

Issue 1: Strategy 1: Encourage and cooperate with the National Marine Fisheries Service (NMFS) and the New England Fisheries Management Council (NEFMC) to maintain ecologically sustainable levels of prey species.

In an effort to keep the abundance of prey species sustainable to maintain the ecology of SBNMS, it was determined that the Sanctuary should set a cap on the level of prey species required to meet the needs of the fishery. However, current fishing regulations exist that set limits for prey species, except for sand lance. The WG decided that as Action 1 for this strategy, the WG would recommend that a directed fishery for sand lance not be developed within the Sanctuary. After amendments were made, the WG accepted Strategy 1 as written in Appendix B of this document.

Discussion: While a cap for prey species is a good idea, species like mackerel and herring already have a maximum sustainable yield (MSY) calculated for them. Herring is also highly mobile, migrating every spring and fall. Sand lance, however, is a different issue since no fishery currently exists, and no MSY has been calculated. In addition, sand lance are often resident within the SBNMS for multiple months. A cap could prevent abundance from getting worse and maintain levels needed to sustain predators. Since no fishery for sand lance exists, the WG agreed that such a fishery should not be encouraged. However, caution was expressed to not ban the catch of sand lance, as this would become problematic for many fisheries.

Comment: Members of the WG stated that the prey species identified are not the only forage species. There are plenty of prey species in the ecosystem.

Comment: If there is a prohibition on sand lance catch, WG members cautioned that sand lance could become a problem for established fisheries in terms of incidental catch.

Issue 2: Strategy 2: Develop research to understand the role of prey species within the Sanctuary and the interaction of actual or potential prey species fisheries on the Sanctuary ecosystem.

While discussing the topic of prey species within the SBNMS, the WG determined that data was lacking on the population dynamics, predator-prey relationships, and variability of prey species within the Sanctuary. The WG agreed that, as Action 1, research should be conducted on the population dynamics of sand lance within the Sanctuary, while Action 2 and Action 3 would focus on the population dynamics of herring and the population dynamics of mackerel respectively. For Action 4, the WG agreed that research should be done to aid in understanding predator-prey relationships within the Sanctuary. It was also determined that little was known on why sand lance abundance was so variable. The WG decided that research should be conducted on the inter-annual variability of sand lance and what is driving this variability. This was added as Action 5. After amendments were made, the WG accepted Strategy 2 as written in Appendix B of this document.

Discussion: Considering the lack of data that exists for many prey species, the WG agreed that the population dynamics for sand lances, mackerel, and herring should be researched. This research should also include studies that further our understanding of predator and prey interactions and relationships. Also, because little is known about the sand lance, the WG agreed that the inter-annual variability of sand lance, and the driving forces behind the variability, should be studied. These issues were added by the WG as actions to this strategy.

ACTION PLAN: Biomass Removal of Commercial Species

The Chair opened discussion on the Straw-man Action Plan concerning biomass removal of commercial species. The proposed Action Plan can be found in Appendix C at the end of this document. All

additions suggested by the WG are marked in **BLUE** and deletions are marked in **RED** font. Issues raised during this discussion are noted below.

Issue 1: Strategy 1: The SBNMS should work with NMFS and NEFMS to ensure that the removal of commercial and recreational species from the Sanctuary is managed appropriately.

The removal of commercial species from the Sanctuary needs to be sustainable. The Sanctuary should work with all parties to understand the implications of the biomass removal of marketable species from within the sanctuary by commercial and recreational fisheries, and to ensure the biological integrity and sustainability of Sanctuary waters. To meet this goal, the removal of marketable species should be appropriately managed under the cooperation of NMFS, NEFMS and SBNMS. In support of this strategy, Action 1 states that the Sanctuary should support the NMFS and the NEFMC in their attempts to manage the biomass of commercial fish/shellfish in the Gulf of Maine as appropriate on a stock-by-stock basis. The WG determined that any stock rebuilding efforts should benefit the Sanctuary. SBNMS should work with the NMFS and the NEFMC to ensure that stock rebuilding efforts will benefit the SBNMS and that rebuilding plans will not inadvertently shift effort into the Sanctuary, thereby increasing biomass removal rates within its boundaries. This idea was added as Action 2. As Action 3, it was suggested that the Sanctuary work with NMFS and the NEFMC to consider imposing a prohibition on night fishing within the SBNMS. The inclusion of this action was debated by the WG. It was determined that this suggestion would not be included, but in its place, wording would be developed to explain why this issue was not being considered.

The WG agreed that information was needed on how much fish were being caught by recreational fishermen. To gain this information, the Sanctuary should investigate the amount of fish caught by recreational fisheries. This was added as Action 4 for this strategy. It was also determined that databases for recreational fishing should be listed. A placeholder was added as Action 4A for this issue, and would be amended at a later date.

To accomplish appropriate management of the removal of marketable species from the SBNMS, the Sanctuary should secure the needed staffing and budgeting resources to examine the impacts of biomass removal on the entire Gulf of Maine ecosystem, and work closely with the NEFMC to begin to address the large scale alterations to the ecosystem that were illustrated for the EAWG. This was added as Action 5.

The WG was in agreement that the Coast Guard should be responsible for enforcement of fishing regulations. However, the SBNMS should work with the NMFS, NEFMC, and the Coast Guard to enforce fishing regulations within the SBNMS in cases where the Coast Guard is unable to adequately enforce Sanctuary fishing regulations. This idea was added as Action 6 to this strategy.

After amendments were made, the WG accepted Strategy 2 as written in Appendix B of this document.

Discussion: While the management of commercial species is important for the Sanctuary, such management should be conducted by the NMFS and the NEFMC. However, the Sanctuary should be supportive of these management efforts as appropriate on a stock-by-stock basis. Action 1 was amended to reflect this idea. An item was presented during scoping meetings to suggest that a prohibition on night fishing be proposed. Though this idea was presented as a potential way to protect local fisheries, it was also viewed by WG members as a fishing effort reduction method. The WG agreed that the focus of the group should be based on clear

ecosystem goals, which this proposal does not contain. The action was removed, but it was decided that the rationale for its removal should be inserted in its place.

The WG debated the use of closed areas within the SBNMS that would prevent the removal of any biomass. This issue was presented as Action 5, but was removed from the Action Plan. Action 6 was determined to be covered in the Prey Species Action Plan, and was removed. Action 7 was removed since it was determined to be redundant with the idea for “green marketing” mentioned above.

The WG agreed that the Sanctuary should have more information on the number of fish caught by recreational fishermen. This was presented as Action 8, which was re-numbered to Action 4 and given a placeholder for Action 4A to include a list of databases on recreational fishing catch.

Action 9 was re-numbered as Action 5 and the WG decided that, as stated in this Action, it was important to identify the need for the Sanctuary to secure the funding and staff necessary to carry out this strategy. The wording of Action 5 would be altered at a later date.

Action 10 was re-numbered as Action 6, and it was determined by the WG that although the Coast Guard was responsible for enforcing fishery regulations, the Sanctuary should work with the NMFS, NEFMC, and the Coast Guard to enforce fishing regulations in cases where the Coast Guard is unable to adequately provide enforcement. Wording for Action 6 was altered to express this idea.

Comment: WG members expressed that area management for night fishing before the NEFMC did not pass the last time it was proposed. Night fishing does not currently occur in State waters, but it has not passed elsewhere. An issue such as this is very polarizing.

Comment: Some WG members stated that diversity among fisheries and ports was needed. The regulation of fishing at night was not an issue for this WG to consider. Any proposed regulation of night fishing should be reviewed by the NEFMC.

Comment: Concerning small area closures in the SBNMS, some WG members expressed that even though a closure would seem to have little effect, determining if this is true should be a point for research. If there was a stated research goal, and a clause that would end the closure by a specific date, such an idea could be acceptable. Knowing what happens when an area allowed to go fallow is a question that fishermen should ask. If there is a place where this research can be done, and apply the results to the SBNMS, then it should be done. We would like the answer to this question but we may not have to close parts of Stellwagen Bank to get it.

Comment: Some WG members felt that any arbitrary closures within the SBNMS would not be acceptable.

Comment: Other WG members stated that closures would not be arbitrary. A method for determining appropriate areas has been developed and was explained by Peter Auster. There is a need for long-term closed areas for research in the absence of fishing; however, this point could be addressed in a different action plan.

Comment: Other WG members felt that closed areas are a management tool to be used by the NEFMC, and that even closed areas for research need to be addressed by the NEFMC. The SBNMS Designation Document would have to be changed for any closure areas to be created.

Comment: For some WG members, research ideas need to be promoted. However, it seems that the current approach is backwards. The first thing needed for a research project is the question that is going to be tested. After knowing the question, appropriate areas can then be identified. Blanket areas are not the correct approach to conduct the best possible research.

Comment: It was important to some WG members that if areas were to be closed for research, then they needed to be used for that purpose. These members did not want to see an area to be closed, then left unused/unstudied for years.

NEW BUSINESS

Pollution Issues

The WG determined that pollution issues will be dealt with during the next meeting. A panel of experts would be assembled to provide information to the EA WG. The following individuals have been identified as candidates to serve on a Pollution Panel for the next meeting of the EA WG:

- Bill Robinson
- Allen Michaels
- Judy Pederson
- James Stewart
- Sal Testaverde

Next Meeting

The next meeting of the EA WG is set for July.

FINAL COMMENTS

Meeting adjourned at 6:00 pm.

Appendix A

Additions are marked in **BLUE**
Deletions are marked in **RED**

ACTION PLAN: Biomass Removal Resulting from Bycatch and Discard

Goal Statement

“The sanctuary should work with all parties to reduce **unintended** bycatch **and discard** of all species, in all fisheries (commercial and recreational) and all gear types”.

Biomass Removal Resulting from Bycatch and Discard Action Plan

INTRODUCTION

The at-sea discarding of fish harvested from the ocean and its associated mortalities have been recognized as an inherent problem in the management of world fisheries for many years (Alverson *et. al* 1994). Such practices constitute a waste of valuable resources and help contribute to observed declines in many of the world’s marine fisheries. A less studied aspect of biomass removal through bycatch is its potential to alter the ecosystem through the differential survival of discarded species. Therefore, fisheries (both recreational and commercial) that remove biomass and return bycatch in the form of discard might have a very substantial affect on the overall ecological balance of species within an area.

Substantial fishing activity (commercial and recreation) occurs within the Stellwagen Bank National Marine Sanctuary (SBNMS). No fishing activity is free from bycatch. Therefore, biomass removal through bycatch has the potential to alter the ecology of the SBNMS. The degree to which the sanctuary might be altered depends on the scale of the bycatch within the sanctuary, the survival of bycaught species and the variation in survival among those species constituting the bycatch. Management of fishing activities within the SBNMS falls primarily within the jurisdiction of NMFS and the New England Fishery Management Council. However, the Sanctuary has a responsibility to work with those agencies to address the potential influence of fisheries bycatch and discard on the sanctuary.

Little detailed information currently exists on levels of bycatch and discard within the SBNMS. However, it seems likely that discard rates might approximate those in other fisheries globally and in the Gulf of Maine. At the global level, the United Nations Food and Agricultural Organization (FAO) estimated that 27 million tons of bycatch are discarded at sea in the course of producing the annual seafood landings of approximately 100 million tons. In Northeastern USA an analysis (conducted by Manomet Center for Conservation Sciences), of 10,000 hauls from commercial trawlers observed from 1990 - 1994 indicated that 47% of the total catch was discarded at sea. Within the Gulf of Maine, mandated mesh size increases and reductions in effort since 1994 have reduced the total level of biomass removal and have almost certainly reduced absolute discard quantities. It is likely that such reductions have also occurred with the SBNMS. However, it is clear that all fishing gears have inherent inefficiencies and few if any fishing gears have been developed that have minimal bycatch and discard.

To address the issue of biomass removal through the bycatch and discard of unwanted species, The Ecosystem Alteration Working Group (EAWG) provides the following Action Plan (AP). The EAWG recognizes that the AP focuses heavily on research needs. The group felt this was appropriate since the current paucity of data was seen as the biggest impediment to a full and lucid understanding of the effects of bycatch and discard on the sanctuary. The EAWG also recognized that the Sanctuary is not an isolated system. Biomass is removed from the greater Gulf of Maine on a daily basis and the implications of this removal might have a more profound effect on the ecology of the sanctuary than removals from the sanctuary itself.

EXISTING REGULATIONS

Fill in

STRATEGIES AND IMPLEMENTATIONS

Strategy 1: Maximize information concerning bycatch and discard occurring within the SBNMS

Action 1. The sanctuary should work **in coordination** with other agencies, fishing groups and NGO's to develop a study fleet of all vessels fishing in the sanctuary. The purpose of this fleet is to understand the rate and composition of bycatch, and how it differs spatially and temporally within the sanctuary (**e.g., acquisition of tow by tow data with built-in mechanisms for checking data accuracy and timely reporting**). Data could be made available directly to the sanctuary or through a third party filter or "firewall" that would protect the individual identity of the contributors.

Rationale: It is currently impossible to quantify the level of bycatch within the sanctuary or understand how it varies by fishery, area or season. Such data are fundamental to understanding the potential for bycatch to alter the local ecology and, if necessary, to design an effective **sanctuary** management regime.

Action 2. The sanctuary should improve information pertaining to the spatial and temporal distribution of commercial and recreational fishing effort within the sanctuary.

Rationale:

Action 32. The sanctuary should conduct **and facilitate** directed **seasonal** surveys to determine the spatial and temporal distribution of ~~vertebrate and invertebrate~~ species within the sanctuary.

Rationale: Bycatch involves the unwanted capture of non-target species or size classes. An understanding of the distribution of species and size classes is an aid to designing methods to avoid their capture.

Action 43. The sanctuary should work with fishermen to use local knowledge to identify the spatial and temporal distribution of species and size classes of key species within the sanctuary.

Rationale: Fishermen have an immense body of knowledge concerning the spatial and temporal distribution of many species and size classes. These data could be collected much more rapidly than that gathered through surveys. Therefore, it could allow for more rapid decision-making and could be used to help structure field surveys.

Strategy 2: Reduction of unintended bycatch and discard from within the SBNMS

Action 1. Methods should be found to avoid the capture of non-target species and size-classes. These methods should ~~first~~ concentrate on gear modifications to separate target and non-target species and size classes, **as well as voluntary avoidance areas** ~~and secondarily focus on time/area closures~~.

Rationale: Reduction of bycatch requires developing methods to avoid the capture of non-target species and size classes. Focusing on such reductions through gear modification will minimize negative impacts to fisheries, while achieving the desired goals in reduction.

Option A: Time Area Closures

Option B: Time Area Closures should not be an Option Unless They Are Voluntary

~~**Rationale**: Reduction of bycatch requires developing methods to avoid the capture of non-target species and size classes. Focusing on such reductions through gear modification will minimize negative impacts to fisheries, while achieving the desired goals in reduction.~~

Action 2. The sanctuary should **promote** ~~increase~~ cooperative research into methods to eliminate all types of **unintended** bycatch through gear modification.

Rationale: The development of gear innovations to reduce bycatch requires the direct cooperation of all interested parties. Fishermen harbor the most extensive knowledge base with regard to fishing gear, how it works and how it can be modified, while gear scientists can provide experimental design aspects that aid in public acceptance of results. Involving conservation interests can further assure that research results meet specific environmental requirements. Forming cooperative projects among these groups will facilitate robust results that can succeed in a problem solving context.

Strategy 3: Increase awareness of low bycatch gear options and provide incentives for their use

Action 1. The sanctuary should convene periodic workshops to **gather, assess, and disseminate information concerning** the state of **reduced bycatch and discard** ~~low impact~~ gears ~~and disseminate information~~ to fishermen.

Rationale: The sanctuary should work to convene periodic workshops to gather comments concerning the ability of particular gear modifications to achieve the desired goal(s) in bycatch reduction. These workshops could also act as showcases that could aid in the acceptance of new technologies by industry and conservation interests and facilitate the diffusion of successful or promising technologies. Such workshops could also be used to direct funding towards the most promising areas of research and focus research on sanctuary goals.

Action 2. The sanctuary should establish a working group to identify appropriate fishing gear and explore sanctuary endorsement for such gear types that can be used in conjunction with “green marketing”.

Rationale: The identification of acceptable gear types is a complex process that requires diverse expertise. The establishment of a sanctuary working group would make such expertise available to the sanctuary and create the ability to identify gear modifications that were deemed beneficial.

Action 32. The sanctuary should provide incentives to use **sanctuary endorsed low-impact** gear through the creation of:
~~— a) incentives Grants for the buy-back of old gear and purchase, e-or construction, and use of sanctuary endorsed approved—low-impact gear.~~
~~— b) Green marketing~~

Rationale: Once gear modifications are proven experimentally successful, they must be diffused through the industry. Such change often requires the discard of economically viable gear and the purchase of new gear at considerable expense. **The Sanctuary could explore grants or other mechanisms** to offset the immediate cost of changing to low impact gear(s). ~~is the most expedient method of creating such change.~~ In addition, the sanctuary ~~cs~~hould explore market incentives that would encourage fishermen to make changes to current fishing practices.

Action 43. The Sanctuary should coordinate with its outreach and education program in making information available about gear methodologies.

~~**Action 3.** The sanctuary should establish a working group to identify acceptable gear types and explore sanctuary “certification” for such gear types that can be used in conjunction with green marketing~~
Rationale: The identification of acceptable gear types is a complex process that requires diverse expertise. The establishment of a sanctuary working group would make such expertise available to the sanctuary and create the ability to identify gear modifications that were deemed beneficial.

Rationale:

Appendix B

Additions are marked in **BLUE**
Deletions are marked in **RED**

ACTION PLAN: Prey Species

Goal Statement

To develop a management strategy for prey species sufficient to maintain the integrity of the ecosystem.

INTRODUCTION

Prey species considered include:

Herring

Mackerel

Sandlance

STRATEGIES AND IMPLEMENTATIONS

Strategy 1: Encourage and cooperate with the National Marine Fisheries Service (NMFS) and the New England Fishery Management Council (NEFMC) to maintain ecologically sustainable levels of prey species.

The sanctuary should cap the level of prey species to meet the needs of the fishery

Action 1. Recommend that a directed fishery for sandlance not be developed within the Sanctuary.

Rationale:

Strategy 2: Develop research to understand the role of prey species within the Sanctuary and the interaction of actual or potential prey species fisheries on the Sanctuary ecosystem.

Action 1. Population dynamics of sandlance within the Sanctuary.

Rationale:

Action 2. Population dynamics of herring.

Rationale:

Action 3. Population dynamics of Mackerel

Rationale:

Action 4. Understanding predator-prey relationships within the Sanctuary.

Rationale:

Action 5. Inter-annual variability of sandlance and what is driving this variability

Rationale :

Appendix C

Additions are marked in **BLUE**
Deletions are marked in **RED**

ACTION PLAN: BIOMASS REMOVAL OF COMMERCIAL SPECIES

Goal: The Sanctuary should work with all parties to understand the implications of the biomass removal of marketable species from within the sanctuary by commercial and recreational fisheries, and to ensure the biological integrity and sustainability of Sanctuary waters

BIOMASS REMOVAL OF COMMERCIAL SPECIES ACTION PLAN

Introduction

To be filled in

EXISTING REGULATIONS

To be filled in

Goal: The Sanctuary should work with all parties to understand the implications of the biomass removal of marketable species from within the sanctuary by commercial and recreational fisheries, and to ensure the biological integrity and sustainability of Sanctuary waters

STRATEGIES AND IMPLEMENTATION ACTIONS

Strategy 1 – The SBNMS should work with NMFS and the NEFMC to ensure that the removal of commercial and recreational species from the sanctuary is managed appropriately.

Action 1 - The Sanctuary should support the NMFS and the NEFMC in their attempts to ~~manage~~ ~~reduce~~ the biomass of commercial fish/shellfish ~~being removed from~~ the Gulf of Maine as appropriate on a stock-by-stock basis.

Rationale: The NMFS and the NEFMC are currently working to rebuild fish stocks in the GoM and Georges Bank through effort reduction measures. Although not directed at the SBNMS, these efforts will provide substantial benefit to the sanctuary.

Action 2 - The SBNMS should work with the NMFS and the NEFMC to ensure that stock rebuilding efforts will benefit the SBNMS and that rebuilding plans will not inadvertently shift effort into the sanctuary, thereby increasing biomass removal rates within its boundaries.

Rationale: Some effort reduction measures instituted within the wider GoM and Georges Bank area might alter fishing practices and increase fishing pressure within the sanctuary. The Sanctuary should work with NMFS and the NEFMC to make sure that such shifts do not occur.

Action 3 – The sanctuary should **work with NMFS and the NEFMC to consider imposing a prohibition on night fishing within the SBNMS.**

Rationale: The removal of commercial species can be managed through a reduction in fishing power. A prohibition on night fishing would reduce power by limiting the time vessels can target particular fish/shellfish aggregations. This would slow and reduce the removal of biomass, increasing the biological productivity of the area. It would also increase the time period over which fish are brought to market, resulting in higher prices and a sustained catch.

~~**Action 5** – The Sanctuary should insure that there are substantial areas within the sanctuary (at least 1/5th of the sanctuary) where biomass is not removed in any way.~~

~~**Rationale:** The intention of this action is to allow some of the ecological interactions and processes that have been changed by biomass removal to restore themselves free of human impacts. This action should be coordinated with the recommendation for research areas, from the evaluation of issue 1.A.1a., since the objectives here are consistent with many of the objective for research areas. It is recognized that some of the consequences of biomass removal for the Gulf of Maine ecosystem can not be remedied by actions within the sanctuary. This will be particularly true for effects due to impact on the largest and most mobile species within the ecosystem. Nevertheless, the vast majority of species in the system can be influenced at that scale of the sanctuary. Even those whose geographic ranging is greater than the sanctuary should benefit by increased availability of forage species, and improved habitat quality within a portion of their total geographic area. It is worth pointed out that there is growing information from research on cod within the sanctuary, that some individual animals do in fact show long-term residency (months to years) in places that offer particularly good habitat (e.g. bolder piles).~~

~~**Option A:** The Sanctuary should work with NMFS and NEFMC to insure that there are no closed areas in the Sanctuary exclusively for research that impact any commercial or recreational fishery unless the impacted users receive full financial compensation for lost commercial and recreational opportunities.~~

~~**Option B:**~~

~~**Action 6** – The sanctuary should prohibit the removal of species that are known to be critical as forage for commercial, threatened or endangered species.~~

~~**Rationale:** Sandlance and herring are well known to draw tunas and great whales to the Sanctuary area. They are also important prey for a variety of commercial fish species. Protecting the food sources of these protected and commercially valuable species should be a high priority within the entire sanctuary. While there is not currently a fishery for the planktonic animals that form the principal food source for right whales, the potential for such fishery in the future should be recognized and management mechanisms put in place now to insure that this can not happen.~~

~~**Action 7** – The SBNMS should work with fishermen to ensure that commercial fish species are removed in a way that optimizes their value~~

~~**Rationale :** Commercial fishing requires biomass removal. By optimizing the commercial value of catch, the sanctuary can ensure that lost of biomass provides maximum social benefit. It might be that such economic gain can allow for reduced rates of extraction from the sanctuary.~~

Action 84 - The Sanctuary should investigate the amount of fish caught by recreational biomass removed by recreational fisheries.

Rationale: Little is known about the quantities of fish removed through recreational fisheries. Such information is needed to understand the potential impact of such fisheries and to understand the contribution of recreational fisheries to the local economy

Action 4a: Placeholder for databases on recreational fishing.

Action 59 - The sanctuary should secure the needed staffing and budgeting resources to examine the impacts of biomass removal on the entire Gulf of Maine ecosystem, and work closely with the NEFMC to begin to address the large scale alterations to the ecosystem that were illustrated for the EAWG, as summarized above.

Rationale: The success of both the sanctuary and regional fisheries rests on improved stewardship through out the region.

Action 610 - The SBNMS should work with the NMFS, NEFMC and the Coast Guard to enforce fishing regulations within the SBNMS in cases where the Coast Guard is unable to adequately enforce Sanctuary fishing regulations.

Rationale: Fishing regulations that apply to the SBNMS result in reduced biomass removed from the sanctuary. Enforcement of such regulations ensures that amounts of fish removed are not excessive and that management activities are equitable .



Gerry E. Studds Stellwagen Bank National Marine Sanctuary
Management Plan Review

Ecosystem Alteration Working Group – Draft Agenda**Date:** 24 May 2004**Location:** Manomet Center for Conservation Sciences, Manomet, MA

TIME	TOPICS AND OBJECTIVES
8:00-8:10	Welcome, Adoption of Minutes from last two meetings. Porter Hoagland
8:10-8:20	Review: Action Items, Porter Hoagland
8:20- 8:30	Discussion and Adoption of Agenda, D. Wiley
08:30-9:00	<u>Presentation</u> - Biomass Removal: Implications of Bycatch <u>Presenter:</u> C. Glass, MCCA
9:00-9:15	Questions
9:15-9:45	Bycatch Strawman Presentation, D. Wiley
9:45-10:00	BREAK
10:00 – 11:30	Bycatch Action Plan development; recommendations and options for SAC, P. Hoagland
11:30-11:50	<u>Presentation</u> - Biomass Removal: Implications of Prey Species <u>Presenter:</u> William Overholtz (NMFS)
11:50-12:00	Questions
12:00-12:30	LUNCH
12:30 -12:45	Prey Species Strawman, D. Wiley
12:45-2:00	Prey Species Removal Action Plan development; recommendations and options for SAC, P. Hoagland
2:00-2:15	BREAK
2:15 – 2:30	Biomass Removal; Commercial Species: Strawman Presentation, D. Wiley
2:30 – 4:30	Commercial Species Action Plan development; recommendations and options for SAC, P. Hoagland
4:30 – 5:00	Biomass Removal Wrap-up
5:00 – 5:30	Next meeting plan, Invited Panel Participants or needed expertise